

# PL 500 Aerobic Treatment Plant Maintenance Guide

## Prior to Servicing Units

It is recommend to have a pre-stocked service and repair toolkit and inventory. A well stocked kit would include: a vacuum/air-flow gauge with  $\frac{3}{4}$ " thread adapter, Aeration line flush tool\*, spare O-rings\*, "sludge-judge", 1000 mL/1L Graduated Transparent Cylinder (or similar container with 10 equal graduations), multi-meter with amperage loop, AC/DC test light, channel lock pliers, chlorine residual testing kit/sample kit (if applicable), various common and Phillips screwdrivers, PVC pipe cutters, wire strippers, marking flags, utility knife, sprinkler adjustment wrenches, shovels, latex gloves, aeration fish tape\*, various (generally  $\frac{1}{2}$ " to 4") sizes of schedule 40 PVC pipe and associated fittings to repair systems in your service, PVC primer and glue (hot glue is useful also), field components associated with systems you service (sprinklers and nozzles, drip line, vacuum breakers, adapters, etc.), 14-2 UF wire with ground, 14 gauge UF wire (in black and white), water proof wire connectors and electrical sealant, toothbrush, paper clips, 50' heavy-duty garden hose, and any other repair parts you deem necessary.

*\*indicates available from PROLINE, bold items necessary to service unit.*

## Owner Notification

The day before (or sooner if possible) a service trip call the homeowner to notify them of a scheduled maintenance visit. Try to give them a time of day (2 hour window), and remind them to make sure access is available and pets are put up from the service area. If you are not able to reach the homeowner or leave a message, make a note in your service log. (it is very crucial that an accurate and complete log is kept for future problem management and audits).

## Service Visit

The day of the maintenance visit, make note of your arrival time on your service sheet. Knock on the door to notify the owner that you will be servicing the system. Make your way to the unit and the field area. If access to the unit is prevented by locked area or aggressive animals (this includes fire-ants or other dangerous pests), use the service door hanger with a note concerning the nature of your visit and why you were unable to service the unit, include a call back number to schedule a return trip and/or give a return trip date and time.

## Inspection of Unit

Upon viewing the unit notice any loose/removed lids, blocked air-intakes, or other problematic conditions. Lids to the unit should be removed from clarifier, aeration, pump tank, and then the trash and pre-treat lid making visual and olfactory (sniff test) inspection of each compartment. The order of lid removal is important to have accurate olfactory test!

**Clarifier** – notice any flocking, if excessive skim excess off. Liquid in clarifier should be clear. Make note if suspended solids larger than a pinhead are seen. No odor or the smell of dirt (earthy) should be detected. Foul odor indicates potential problems. Use sludge judge to check level of settled solids (sludge). **DO NOT USE SLUDGE JUDGE WITH A DIAMETER GREATER THAN 2"!!! IT WILL NOT FIT THOUGH THE BOTTOM OF CLARIFYING CONE!**

**Aeration Chamber** – notice that the liquid is rolling with very fine to large bubbles. If the liquid is still, there is a problem. A earthy smell in this chamber is normal; it should not smell foul (septic). Check the color of the liquid with a sample bottle or sludge judge; liquid should be light to dark brown, not black or grey. Black or grey indicates problems. A 30-min settling solids test should be done to a sample from this chamber. Using a graduated cylinder, take a sample from the aeration chamber while operating. Take percentage of volume measurements at 5-minute intervals for 30 minutes. Make note of the solids that are settling; they should be small brown particles. At the end of the test, there should be 0%-60% settled particles. More that 60% indicated need for pumping of the system. There may be light foam in the chamber; thick foam indicates problems.

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WASTEWATER EQUIPMENT, L.L.C.

**Trash and Pre-treatment** – Some odor after removing this lid is normal, being as the trash compartment accepts the raw sewage from the home. There should be a scum layer on the surface of the initial Trash compartment. The pretreatment compartment should have thinner scum layer. The heavy solids in the initial Trash compartment should not be deeper than 18". If thick solids have accumulated to deeper than 18", the system should be pumped.

**Pump tank-** Depending on the type of system and local requirements, this check will include filters, pump, floats, etc. Each should be serviced as necessary. There should be no odor to an earthy smell in this tank. If chlorination is used, there may be a slight chlorine smell.

If chlorination is used, make note of the amount of disinfectant left (liquid or tablet), and perform a chlorine residual test on a sample according to your chlorine residuals kits instructions. Kits vary as to the size of the sample and steps for determining residual.

(Residual should be greater than 0.1 mg/L)

Other tests may be required including samples for TSS, fecal coliform, CBOD, etc. Be sure to use gloves and proper sanitary practices when taking samples.

**Control Panel-** Make sure the wires entering the control panel are sealed at the conduit entering the control panel. Check the alarms operation. Check timers (if present) and all control switches for operation. Note any problems for repair. **BE SURE TO TURN OFF POWER TO THE CONTROL PANEL BEFORE ANY REPAIRS ARE MADE TO WIRING!**

After checking the control panel, mark your weather proof sticker or tag to note the visit. The mark must be permanent (not able to be erased) with the date. Sticker or tags must have the Service Technician's name and/or company name, phone number, and start date of maintenance agreement. PROLINE also has an example sticker and punch tag.

**Distribution/Discharge-** Note any irregularities or apparent problems in your report.

**Effluent Quality** - Evaluate the final effluent discharge for color, odor, turbidity (cloudiness) and appearance of solids. The effluent should be clear without odor and virtually free of any floating solids. A sample may be taken at the discharge or at the clarifier tee. Sample

may be should be made with a clear collection bottle via hand pump or other approved device.

Samples should conform to the NSF/ANSI Standard 40 requirements:

CBOD<sub>5</sub>: 30-day average of < 25 mg/L

7-day average of < 40 mg/L

TSS: 30-day average of < 30 mg/L

7-day average of < 45 mg/L

## Proline Policy for Pumping

System should be pumped at least every 3 years or more often if necessary.

## Reports

If pumps are showing signs of needing replacement, the system is near needing to be pumped, or other potential service or non-service related issues are found, please make note in your report to the homeowner.

A breakdown of the cost of materials and labor should be given to the homeowner before any repairs are made. (If the aeration pump needs replacing, the homeowner can order the pump directly from PROLINE and receive a pro-rated rebate after the old pump is shipped back to PROLINE. Be sure to quote the owner the cost for service on replacing the pump.) This allows the homeowner as much warning as possible of a future expense.

## Service Frequency

Units should have required maintenance performed every 4-6 months (or more frequently if required by local codes).

### Required Maintenance-

**!!!BE SURE POWER IS DISCONNECTED AND SYSTEM IS OFF BEFORE PERFORMING MAINTENANCE!!! FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH!!!**

**Flush/Clear Air Intake Ports** - The air intake ports must be kept clear of debris to maintain proper function of the PL-500. The Aeration fish tape or other suitable device can be used to clear the holes at each service (holes/lids may also be sprayed clean with a waterhose).



*Remove Circulation Pump and Connected Assembly for remaining steps. Open the union at the Circulation Piping. Be sure to secure O-rings for the union. Pull assembly out of tank with air hose assembly still connected.*

**Flush Air Hose Assembly** - Removed the air intake cap inside the riser and connect the Aeration line flush tool. Then connect a waterhose to flush the Air Hose Assembly. (The Aeration line flush tool includes a backflow preventer to prevent a cross-connection) After flushing clean air intake cap of any debris, remove the the Aeration flush tool and waterhose, and replace the cap. The Air Hose Assembly can now be disconnected at the union to continue service. Be sure to secure the O-ring for the union.

**Clean Pump** - The Circulation Piping Assembly and Pump can then be cleaned/sprayed off with the waterhose. Typically there will be a 1/8" to 1/4" build-up on the components. Be sure to thoroughly spray and clear the pump intake of build-up. The pump may then be removed from the Circulation Piping and Aeroblend Device.

**Clean Circulation Piping and Aeroblend Device** - The Circulation Piping and Aeroblend Device will have some scum build up on their interiors. This should be sprayed clean with a waterhose.

**Re-assemble Components** - Re-assemble components in order of removal (be careful to only hand tighten connections). Special care should be made to be sure the Aeroblend Device is properly aligned (Arrow in direction of flow/ away from the pump). Failure to do so will result in lack of aeration and digestion. Care should also be made to inspect the O-rings for cracks or wear. Any worn or cracked O-rings should be replaced. **DO NOT ASSEMBLE COMPONENTS WITHOUT O-RINGS IN PLACE!!!** The O-rings provide a critical seal that would otherwise cause a system failure.

Check wiring for nicks/cuts and/or loose connections.

After Components are in back in place, power on the unit. Review inspection points for Aeration Chamber.

Replace lids and complete inspection reports.

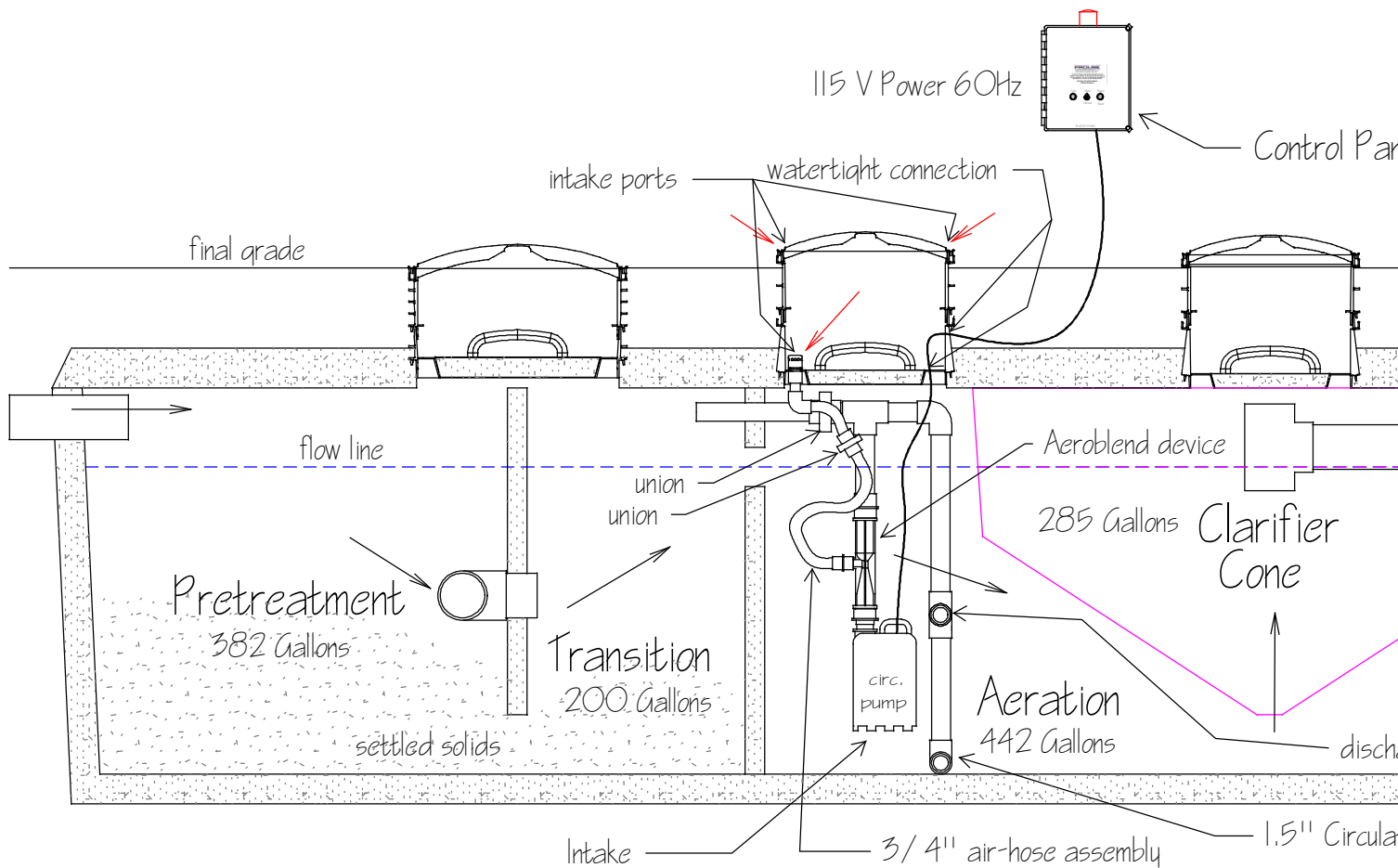
## Finishing Maintenance Visits

Return items moved or otherwise disturbed to their original locations and clean your work area around unit (remove any trash, (used gloves, packaging, paper townels, etc.), clean up any "messes" from your service, etc.). Be sure to leave a report with the owner, or a report attached to the doorhanger. Close any gates/doors or other entries used for service as you leave the property.

It is PROLINE's desire that the service and maintenance of our units be simple and safe. Please practice proper safety by using appropriate tools and equipment when servicing the PL-500.

Should problems arise when performing routine maintenance or repair/emergency maintenance please refer to the Troubleshooting Guide.





| PL-500                                 |                       |              |  |
|--|-----------------------|--------------|--|
| System<br>Proline PL-500               | O&M / Troubleshooting |              |  |
| Designed by<br>Brandon Couch, R.S.     | Illustration          |              |  |
| For<br>Proline Wastewater Equip., LLC. | Side View             |              |  |
| APPROVED<br>NSF Review                 | Type                  | Part Number  |  |
| 2-9-2006                               | 2D                    | PL-500       |  |
| SCALE 1" = 18"                         | REV 5.2               | SHEET 1 OF 1 |  |

→ = air flow

→ = system flow

